CloudSat/CALIPSO Validation Experiment (CC VEx)
Mission Report: Friday July 28, 2006

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Mission Summary

The Cloudsat and Calipso (CC) satellites passed along the eastern coast of Florida at approximately 18:48 UTC between roughly Miami and Cape Canaveral. Following a departure from Robbins Air Force Base (RAFB) at 16:54 UTC, the NASA Dryden ER2 flew southward along the CC ground track and then returned northbound and intersected the CC ground track near 24º 30' N. Clouds associated with active convection were sampled by instruments on the ER2 and the A-Train along the track. These clouds consisted of thick anvil outflow, developing convective elements, thin anvil cirrus, and deep precipitating clouds.

The WMI Lear Jet flew southbound along the CC track near Cape Canaveral during the overpass sampling anvil cirrus.

Both aircraft then transited to a region of cirrus uncinus generating cells 100 Nm west of St Petersburg, Florida where data were collected by the remote sensing and in situ instruments for approximately 2 hours.

Both aircraft returned to RAFB at approximately 22:30 UTC.

The NASA LaRC B-200 did not participate in today's mission.

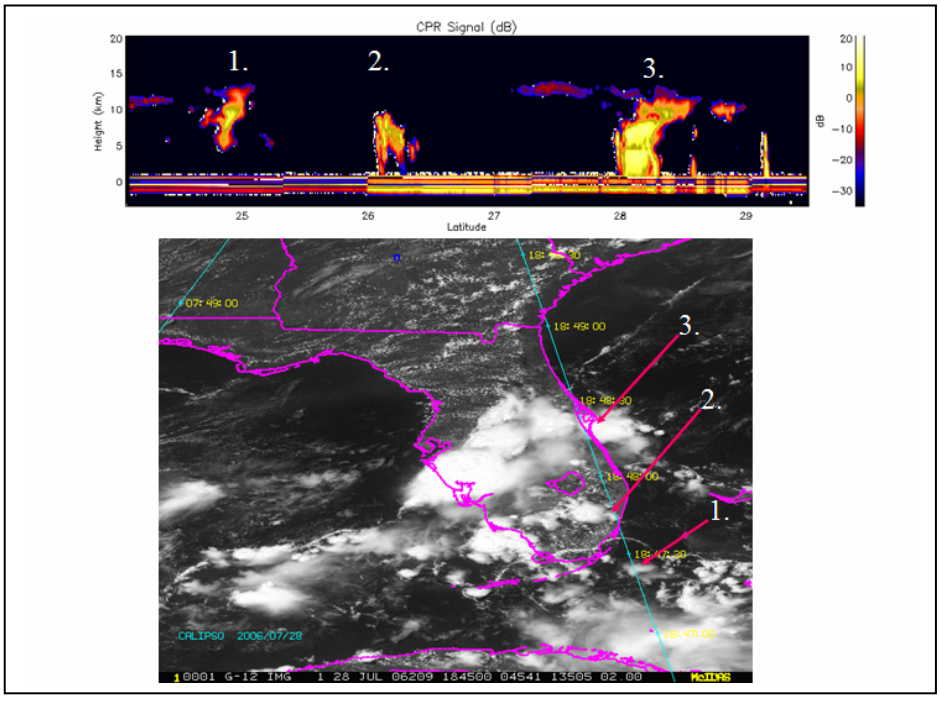

Figure 1. Cloudsat radar imagery (top) along the flight track shown in the bottom GOES Visible image (Courtesy Bill Smith Jr.). Features are noted with numbers.

Science Objectives:

1. To obtain coordinated aircraft/satellite observations above convective clouds to examine the instrument performance, detection thresholds, and calibration during daylight for the CALIPSO lidar and CloudSat radar.
2. To obtain in situ ice/water cloud measurements with the LearJet coincident with the ER-2 and A-train overpasses.

Flight Plan:

The ER-2 took off from RAFB at 16:54 UTC and transited southward along the CC ground track returning northbound along track at 24º 30'N. The overpass of the ER2 by the CC satellites occurred at 18:48 UTC at 25º 52.4' N 80º 5.2' W. The ER2 continued along the ground track to 28º 57.3'N 80º 52.0'W where it continued along the track for an additional 20 km as briefed. The ER2 then transited southwestward setting up a line from 27º 26.5'N 82º43.16'W to 26º 51.03'N 84º 32.53'W. This length of this line was flown six times to make 3 full circuits between 19:55 UTC and 21:27 UTC. The ER2 landed at RAFB at approximately 22:25 UTC.

The WMI LearJet took off at approximately 1745 UTC and flew southbound along the CC track near Cape Canaveral during the overpass sampling anvil cirrus. The Lear then sampled in situ generated cirrus uncinus under the ER2 line for approximately 2 hours conducting stepped level legs during that period.

Meteorology:

On the large scale, an upper tropospheric trough was dissipating in the subtropical western Atlantic inducing a weak closed circulation over the northern Florida peninsula while a weak easterly wave transited toward Cuba and the Florida Straits. Developing convection in the Florida Straits was sampled initially along ER2/CC track. Convection along the sea breeze front along the Florida east coast was well inland by the time of the overpass, and a second round of active convection was developing in the modified maritime air near Miami. Meanwhile a complex of deep convective cells existed near Cape Canaveral during the overpass that had been active for several hours with new convection initiating from outflow boundaries during the time of the overpass.

Instrument Status Report:

- NASA Dryden ER-2: science instruments performed nominally. The Reveal system did not produce usable data.
- WMI LearJet: all instruments performed nominally.
- NASA LaRC B-200: HSRL completed optics alignment and integration on the B200.

Upcoming Flight Opportunities:

Due to less interesting science objectives along the CC overpass track over the Gulf of Mexico and the expectation of poor weather conditions in the Warner Robbins area, no flights are scheduled for Saturday 29 July. We are anticipating a flight by the ER2 to the eastern Caribbean on Sunday 30 July where convection is expected to be active and Saharan dust to be present. The WMI Lear will coordinate with the ER2 in targets of opportunity during the ER2 return leg.

The CC-VEX website can be found within the Mission Data section of the NASA Suborbital site http://suborbital.nasa.gov/media/index.html